

**Ames Laboratory/ISU High School Science Bowl  
Saturday, Jan. 29, 2005**

Ames Laboratory and ISU will host the 15th annual Science Bowl for high school students on Saturday, Jan. 29, in the Memorial Union. Approximately 90 volunteers are needed for the 48-team competition. Volunteers will receive a Science Bowl T-shirt, lunch and free parking in the Memorial Union ramp on the day of the event.

Science Bowl training is mandatory for all new volunteers. Individuals who have served as volunteers in past years are not required to attend training. However, training offers a good review of the rules just prior to the competition and is recommended for that reason. (NOTE: Training will be held during the weeks of Jan. 17 and 24. Training information will be sent to volunteers in early December.)

To volunteer, please complete the form below and return to Saren Johnston, 111 TASF, by Friday, Nov. 19.

-----[Cut out and return this form]-----

Yes, I want to assist with the 15th annual Ames Laboratory/ISU Science Bowl.

Name: \_\_\_\_\_

Campus address: \_\_\_\_\_

Campus phone: \_\_\_\_\_

E-mail address: \_\_\_\_\_

I am a first-time Science Bowl volunteer Yes\_\_\_ No\_\_\_

I competed in the Ames Lab/ISU Science Bowl as a high school student. Yes\_\_\_ No\_\_\_

My area(s) of scientific expertise (if applicable): \_\_\_\_\_

T-shirt size: \_\_\_S \_\_\_M \_\_\_L \_\_\_XL \_\_\_XXL \_\_\_Other (please specify) \_\_\_\_\_

I would like to serve as a:

\_\_\_ **Moderator** (reads questions, must be able to pronounce scientific terms accurately)

\_\_\_ **Judge** (resolves scientific question challenges, ensures competition rules are followed)

\_\_\_ **Scorekeeper** \_\_\_ **Timekeeper** \_\_\_ **No preference**

\_\_\_ I will help set up competition rooms in the Memorial Union on Friday, Jan. 28, at 7 p.m. (Supper will be provided.)

I prefer to volunteer (check one):

\_\_\_ 8 a.m. - 5 p.m. \_\_\_ Noon - 5 p.m.

\_\_\_ 8 a.m. - Noon. \_\_\_ No preference

Please contact me about volunteering for the Ames Lab/ ISU Middle School Science Bowl.

\_\_\_ Friday, April 8 – Hydrogen fuel-cell car competition

\_\_\_ Saturday, April 9 – Academic competition

**Hansen Lecture Set for Nov. 4**

The Hansen Lecture will be Thursday, Nov. 4, at 2:10 p.m. in 301B Spedding Hall. Dr. William A. Goddard, Charles and Mary Ferkel Professor of Chemistry, Materials Science, and Applied Physics and Director of the Materials and Process Simulation Center at

Caltech University, will be the guest speaker. The title of his lecture is "Strategies for de Novo Multi-Scale Simulations and Applications to Materials, Catalysis, Protein Folding and Nanotechnology."



## Science Bowl Support Grows



**Ed Yeung**, director of Ames Lab's Chemical and Biological Sciences Program and an Iowa State University distinguished professor of chemistry, has been named the first recipient of the newly created Ralph N. Adams Award in Bioanalytical Chemistry. The award was created in memory of Ralph N. Adams, a renowned, post World War II analytical and electroanalytical chemist, and an inspiring teacher. The Adams Award recognizes Yeung's outstanding scientific contributions

that encompass many issues fundamental to bioanalysis. His studies of individual enzyme molecules define the most sensitive level of detection of biomolecules and revealed that the catalytic activity of the same enzymes differs. The work has led to many single-molecule studies in other research groups and promises to impact molecular modeling, drug design and catalytic studies. "I can think of no individual more deserving of the Adams Award than Ed Yeung," says Ames Lab Director Tom Barton. "Ed's cutting-edge research continues to amaze the scientific community." Yeung will receive the Adams Award in Bioanalytical Chemistry at the 2005 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, PITTCON 2005, Feb. 27 through March 4, in Orlando, Fla. ■



**George Kraus**, assistant director of Ames Laboratory's biorelated initiatives, director of the Lab's Biorenewable Resources Consortium, and an Iowa State University professor of chemistry, received a Regents Award for Faculty Excellence at ISU's fall convocation, Sept. 27. The Regents Award for Faculty Excellence recognizes a faculty member who is an outstanding university citizen and who has rendered significant service to Iowa State Uni-

versity or the state of Iowa. Kraus has helped bring together scientists from the physical sciences, engineering, agriculture and biology in interdisciplinary initiatives that have charted new directions for research at Iowa State. Kraus is also director of the Center for Catalysis in the Institute for Physical Research and Technology and helped establish the Center for Research on Dietary Botanical Supplements. ■



**Marc Porter**, an Ames Laboratory associate and an Iowa State University professor of chemistry, received the Margaret Ellen White Graduate Faculty Award at ISU's fall convocation, Sept. 27. The award recognizes superior performance by a member of the graduate faculty who serves as a mentor and enriches the student-professor relationship through support and attention to detail, enabling students to finish their work in

a timely and scholarly manner. Porter is a productive scholar and a supportive mentor. He has helped many graduate students earn their doctoral degrees and secure positions in universities and major research laboratories. He prepares graduate students for their careers by including them in grant writing and reviewing, manuscript reviewing and determining research directions.

**R**ockwell Collins is continuing its generous support of Ames Laboratory and Iowa State University efforts to promote science education in Iowa. In October, the Cedar Rapids-based aviation and information technology company doubled its investment in Science Bowl to \$2,000 for 2005. Rockwell Collins has been a tremendous partner in Science Bowl, supporting the event for the past six years.

The Pella company also continued its long-term investment in Science Bowl with \$1,000 to support the 2005 competition. The window and door manufac-

turer has also supported Science Bowl for the past six years, contributing \$6,000 to the event over that time period.

Our thanks for the continued support from these two Iowa companies. Their support has not only helped the Laboratory continue the High School Science Bowl but also add a Middle School Science Bowl competition. Volunteers are always needed for these events. The High School Science Bowl is January 29, 2005, and the two-day Middle School Science Bowl is April 8-9, 2005. ■

## Snyder Shines in Sailing Competitions

**J**ohn Snyder, associate scientist and faculty advisor to the ISU Sailing Club, captured first-place honors in both regional and national sailing competitions this summer. Snyder served as skipper for both events that included the FJUS Sailing Class Eastern Regional Championships, which he organized, and

the FJUS National Championship. Snyder is the first skipper to win both of these events in the same year. FJUS Championships are raced in International FJs, 13.5-foot, two-person boats that have a mainsail and jib, a spinnaker for sailing downwind, and a trapeze for the crew. ■



*Skipper John Snyder (left) and crew member Lu Han, display the winner's trophy for the FJUS Eastern Regional Championships.*

# Preserving the Power

*Lab focuses on energy-saving practices*

**W**hen it comes to energy conservation, we have the power – all of us – to eliminate unnecessary losses. That's the message Facilities Services engineer Mike Vaclav would like all members of the Lab's community to take to heart.

## Let there be light – efficiently!

According to Vaclav, the Lab's biggest loads on energy are environmental control and lighting. "If we can address lighting, that's a big chunk of it," he says. As part of that initiative, Facilities personnel have installed automatic light sensors in bathrooms throughout the Lab. The lights will go out after 20 minutes if there's no motion in the room.

"We're also evaluating other areas for light sensors, particularly for after hours use in the hallways," says Vaclav. "Unless someone walks through a hallway, the lights will remain off from 6 p.m. to 6 a.m."

Another lighting project Facilities has undertaken is replacing all the bulbs in the Lab's exit lights with LEDs. "Individual LEDs can cost up to \$30 a bulb," says Vaclav. "That's a fairly substantial investment," he admits,

"but it should pay back within five years just on the electricity we save. The LEDs use only two watts of electricity compared to the 7-15 watts used by the current incandescent bulbs, and they'll last over 100,000 hours, or approximately 15 years."

Vaclav says the switch to LEDs in the Lab's exit lights will be on a "replace-as-we-go basis." He notes that TASf probably won't be involved in the process because, as a newer building, the exit signs already use low-wattage fluorescent bulbs.

## Water, water everywhere – use it wisely

In addition to their efforts to conserve energy through various lighting changes, Facilities is putting more emphasis on water conservation. Vaclav explains that one of the issues involved in water conservation at the Lab comes into play whenever there's a purchase of a new piece of equipment that needs to have water circulated through it for cooling purposes. "The first instinct is to hook a hose up to the faucet and run water through the instrument and then down the drain," he says. "But all of our buildings have closed-loop systems, which

allow us to circulate water for that specific purpose. There's a set volume of water, and we just keep cooling it and recirculating it. We keep track of equipment that requires cooling so we can get it hooked up to our system as soon as possible." Vaclav notes that the closed-loop systems have allowed the Lab to cut its water consumption nearly 60 percent since 1980.

"The Lab has been very good about water conservation, and we'll continue to add to those efforts," says Vaclav. "We'll be doing more audits or walk-throughs to make sure there are no leaky faucets and steam traps, and we'll be checking deionized water use. Employees should call us if they notice a leaky faucet, and we'll get it fixed."

Looking to the future, Vaclav says Facilities will be considering things like automatic flush valves and infrared faucets as replacement parts when things fail and as areas are renovated.

## Do your part

When it comes to identifying causes of unnecessary energy losses at the Lab, Vaclav emphasizes that at the top of his list of offending practices are those involving fume hoods. "Of particular concern is the poor performance we see in closing the sashes on fume hoods and turning the controllers to setback when the hoods are not in use," he says. He explains that those simple steps reduce the amount of air the hoods suck out of the Lab's buildings, which means just that much less to condition or heat.

"We monitor the hoods, and we get a very low participation in regard to shutting the hoods down when they're not in use – probably less than 50 percent," Vaclav says. "At its root, that lack of participation is a line-manage-



**To cut down on energy losses, users of fume hoods should close the sashes and turn the controls to "setback" when the units are not in use.**

ment and training issue that adds up to the tune of \$1,000 per hood per year in energy costs."

As it turns out, participation is pretty much the key to most successful energy-conservation efforts, and that participation includes not only activities performed, but also products purchased. For some time, the Lab has participated in Energy Star as described in Executive Order 13123. Energy Star guidelines require agencies to purchase products in the upper 25 percent of energy efficiency. Now Vaclav says the Lab is also committed to a new DOE energy-savings initiative that extends the goals set by Energy Star.

Executive Order 13221 directs agencies, when feasible and cost-effective, to purchase products that use one watt of power or less during standby ("off") mode. "The program focuses on devices that are never truly off because they have a clock on them or they have an automatic on with a remote control," Vaclav explains. "They still draw power, and there are recommendations on what



**LED bulbs (right) are gradually replacing less energy-efficient incandescent bulbs in the exit signs of the Lab's buildings.**



those efficiencies should be. This program is something the DOE is really pushing because devices that use standby power, such as computers, can create a significant load that you don't think about. Employees should

turn their computer monitors off at the end of the day because, even in sleep mode, they use a lot of energy."

As employees consider purchases of office equipment and laboratory instruments, Vaclav

is hoping they will adhere to the rules of good research and investigate the various energy-efficient choices available. He urges anyone involved in the purchase of new equipment to visit the following Web site and learn more

about how to buy products with low standby power: [http://www.eere.energy.gov/femp/technologies/cep\\_standby\\_power.cfm](http://www.eere.energy.gov/femp/technologies/cep_standby_power.cfm). ■

~ Saren Johnston

## Fond Memories of a "Material" World

*Rose Bielefeldt retires from Lab and MEP Program*

"It will always be Metallurgy and Ceramics to me," says Rose Bielefeldt, speaking about her 25-year Ames Lab career as an administrative specialist in what is now called the Materials and Engineering Physics, or MEP, Program.

"I have many wonderful memories from my years at Ames Lab. It's a super place to work," says Rose, noting that she feels especially privileged to have worked with members of the MEP staff from whom she says she always received excellent support and cooperation. "The program has always been very family-oriented, caring and supportive of individuals," she says.

If the Lab gave an award for working with the most program directors, it's highly likely that Rose would take home the prize. Her career at the Lab not only spans 25 years in the MEP Program, it also includes six different program directors: Frank Nolfi, Bruce Thompson, Dave Peterson, Otto Buck, Iver Anderson and Brian Gleeson.

"It was a privilege to work with each of them," says Rose. "I learned about the work of the program as well as life lessons involving the integrity, honesty and responsibility you bring to the workplace and to your personal life."

There's certainly no doubt that the MEP Program has high regard for Rose and her outstanding support of its mission and staff over the years. Brian Gleeson, MEP program director, says, "Rose has been an invaluable member of the Materials and Engineering Physics Program, better known colloquially as the 'Metallurgy and Ceramics Program.' I know that I am not alone when I say that it was truly a pleasure to work with Rose. Indeed, she gained the utmost respect from those she worked with, and that came not only from Rose being extremely proficient at her job, but also from the fact that she is such a sincere, friendly and sensible person. I really can't overstate how much we appreciate what Rose has given to the program."

MEP secretary Anne Coffman expresses similar sentiments. "It has been a true privilege and pleasure to work with Rose for the past 16 years. It has been a wonderful experience to work with such a dedicated, positive and pleasant individual. She truly captures the meaning of co-worker in the work family and has served as the heart of our program for over 25 years. I wish the very best to Rose in all of her future endeavors and know that she will continue to be produc-

tive and complement whatever avenues she pursues."

Although Rose officially retired at the end of June, she's been returning to the Lab on an hourly basis to help ease the transition of duties within the MEP director's office. And this winter she'll take on the huge task of sorting through, weeding out and organizing some 20 years of back files for the program. She's the logical choice for the job because she's worked with so many past program directors.

Rose says she misses her MEP co-workers but admits that she is thoroughly enjoying retirement. "It's great. I'm getting back to hobbies and interests that I haven't pursued in years, including cooking (especially baking), gardening, leisure reading, travel, sewing and community service," she says. "So far, I'm amazed at how quickly the days go by and how little I get done!"

Rose and her husband, Bill, have been to all 50 states, many of them several times. Some of their favorite places to visit are the national parks and the New England states of Maine, New Hampshire and Vermont. But the couple's enthusiasm for travel involves more than just the time spent at the final destination.

"We enjoy researching the trip months ahead of time and



Rose Bielefeldt

planning for stays at historic hotels, inns and bed and breakfasts," she explains. "We particularly treasure the special times we spend with our two daughters who live in Colorado and California."

While looking forward to new travels and adventures in retirement, Rose takes time to reflect on her Ames Lab career. "I appreciate the opportunity our program gave me to serve them all those years and the extremely well-qualified clerical staff who were so important to my ability to do a good job," she says. ■

~ Saren Johnston

# The Lost Ball Open

*Tourney recognizes David Hoffman's service to Lab*

When David Hoffman retired from his Ames Laboratory position as Division Director of Science and Technology at the end of August, Tom Barton and Maggie Haaland decided another ho-hum reception was not how to properly recognize his 37 years of service to the Lab. It wasn't long before the appropriately named Lost Ball Open was being organized. (Yes, there's a whole other story behind the name!)

Originally scheduled for Oct. 1, the golf tournament fell victim to Iowa's fickle weather and was cancelled due to rain and cold. But all was not lost – not yet. The Lost Ball Open was rescheduled for Oct. 7 at Twin Anchors Golf Course. It was there that the players began losing it, rather them – the golf balls – whatever! Hoffman, himself, managed to hit the most balls into the water, receiving the perfect prize of a ball retriever for his heroic efforts.

Maggie Haaland, administrative specialist, captured a foot wedge for the most creative scorekeeping. The foot wedge is a novel little invention by Director Tom Barton that can be used to

masterfully free a golf ball from between a rock and a hard place.

Winner of the grand prize at The Lost Ball Open, which is some day to be known as the David Kingery Hoffman Memorial Open, was senior metallurgist Tom Lograsso. His prize – dinner fore Fore and a fine Iowa wine.

"Actually, Lograsso's low score of 38 was matched by Mark Murphy, but Murph had cut out already, so the 'fore' frozen dinners were given to Tom," Barton says. "The secretaries in 311 TASF would not let me return them to the freezer where they had resided for more than six months!"

Lograsso also won sleeves of balls for his alleged closest drive to the pin on #4 and longest drive on #6.

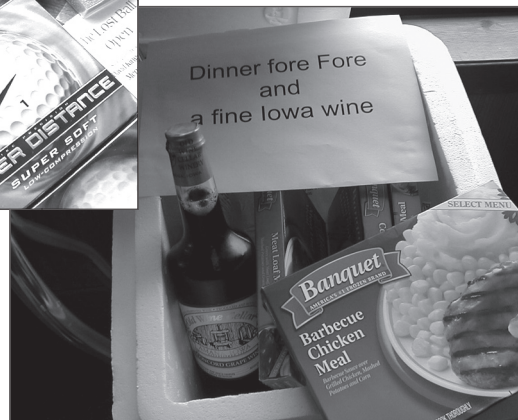
In addition to the well-earned

ball retriever, Hoffman came out of his retirement tournament with a pair of foot-wedge-equipped tennies and a specially designed ball mark repair tool, complete with Ames Lab logo. Hoffman may have escaped the customary retirement reception, but he still received the traditional plaque from Barton. The inscription reads, "Presented to David K. Hoffman on this the occasion of The Lost Ball Open, October 1, 2004. For grateful recognition of 37 years of dedicated and productive service to the Ames Labora-



**Left -- Some of Hoffman's loot: official retirement plaque, foot-wedge-equipped tennies, and ball mark repair tool.**

**Below -- This dinner fore Fore and a fine Iowa wine went to Tom Lograsso.**



tory and IPRT."

Although Hoffman has retired from his Ames Lab duties, he's continuing to teach chemistry at Iowa State and will no doubt be looking forward to a few more opportunities yet this season to make use of his well-earned golf ball retriever. ■

*~ Saren Johnston*

## INSIDER

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# INSIDER

Newsletter for the Employees of Ames Laboratory ■ Volume 15, Number 9 ■ October 2004

## Finding Starfish Far from Any Ocean

*Phenomenon may help unlock secret of quasicrystals*

**C**reatures at home on an ocean reef would seemingly have little connection with a materials laboratory in the middle of Iowa farm fields. But five-legged starfish share a common symmetry with a quasicrystalline phenomenon discovered by a group of Ames Laboratory materials chemists. Led by senior chemist Pat Thiel, the group has found that a clean, quasicrystalline substrate acts as a template, as demonstrated by the way aluminum atoms cluster in “starfish” shapes at specific sites on the substrate.

The discovery is just the latest piece of the puzzle surrounding quasicrystals. These mysterious metallic alloys, most of which contain 60 to 70 atomic percent aluminum, are somehow able to form into crystals – usually with a five-fold symmetry – in which the atoms are ordered, but without the periodicity common in crystalline materials. Though a direct correlation to the atomic structure has yet to be drawn, quasicrystalline materials are hard, slippery, poor conductors of heat, and resistant to attack by other chemicals. Such properties make them particularly useful for applications requiring resistance to wear, low adhesion or a thermal barrier.

Because such properties relate to interactions taking place on the surfaces of the materials, study of the surfaces of quasicrystals was a logical starting point. It was also a particularly attractive problem to Thiel, who specializes in surface characterization of materials.



**Ames Lab senior chemist Pat Thiel holds a dried starfish that once lived on the ocean floor. The starfish, with its five-legged symmetry, is symbolic of a phenomenon discovered on how materials deposited on a quasicrystalline substrate form in star-shaped clusters around specific “trap” sites on the substrate surface.**

“There were some wild speculations about the surfaces of quasicrystals, but when we started, those hadn’t been backed up by experimental data – no one had really taken a look at what was happening on the surfaces of these materials,” says Thiel, who credits Ames Laboratory physicist Alan Goldman for *continued on page 2*



## Finding Starfish Far from Any Ocean *continued from page 1*

introducing her to the subject and for fostering the Lab's ongoing research efforts in the quasicrystal field.

"It took us a year or so to formulate the specific questions that needed to be asked," she says, "like what is the structure of the clean surface?" According to Thiel, who is also an Iowa State University distinguished professor of chemistry, even that seemingly simple question was controversial.

Though lacking a periodic structure, quasicrystals do contain small clusters of atoms. "To create a flat surface would mean cutting through some of the atom clusters, and a segment of the research community believed that you couldn't do this and have a flat surface that was also still quasicrystalline," Thiel says, adding that the notion was dismissed as heresy by some of the more fervent quasicrystal devotees.

Because many quasicrystalline materials are aluminum-rich and because aluminum oxidizes very easily, it was necessary to prepare and study samples in ultrahigh vacuum to look at a "clean," unoxidized surface.

Thiel's group developed a method to clean the surfaces of quasicrystalline aluminum-copper-iron samples with an ion beam to remove any surface oxidation, followed by heat treatment. Using a number of techniques, including low-energy electron diffraction, her group discovered the surfaces are indeed flat and quasicrystalline.

They also found that there are clearly layers, as evidenced by stepped "terraces" on the cleaned sample. Consistent with basic surface science principles, the surfaces of these layers were aluminum-rich and densely packed, and each layer was comprised of two planes of atoms, 0.4 Angstroms, or Å, apart. The visible

steps were the separations between the favored terminations.

Additional study of these layers showed that there are recurring features, so-called "flowers" of atom clusters. The flowers are comprised of 20 atoms of aluminum, arranged in two rings around one iron atom. By connecting the iron centers of these flowers, a clearly pentagonal, long-range order emerges in an otherwise aperiodic material.

### Starfish phenomenon

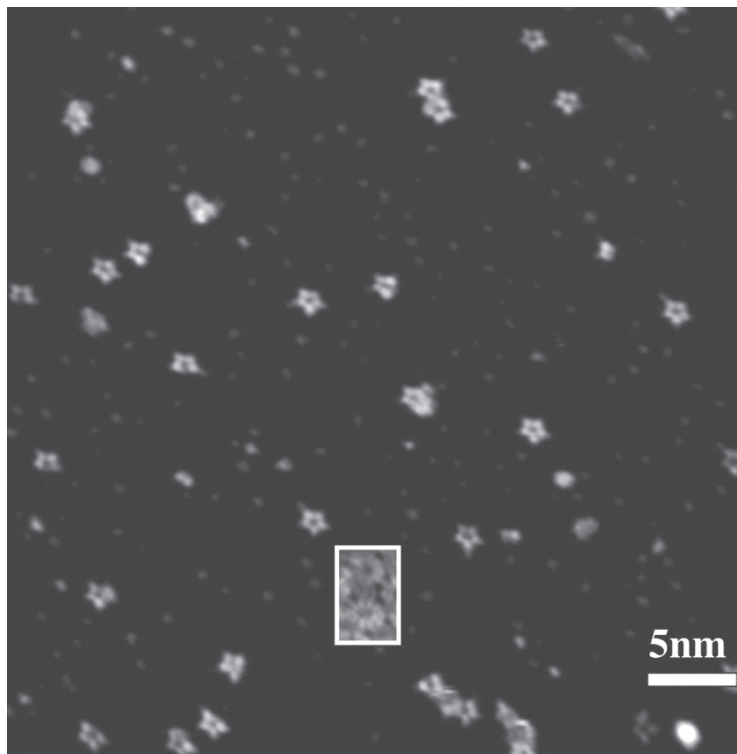
With this new detailed understanding of the surface, the next step was to look at depositing material back onto a clean quasicrystalline surface to see if it would act like a template, a phenomenon called pseudomorphism. To do this, Thiel turned to thin-film techniques that allow layers only a few atoms thick to be deposited.

"We know that pure silver, for example, doesn't want to form a quasicrystal in bulk," Thiel says, "but this might be a way of forcing it to form a quasicrystal for at least one or two atomic layers. Then we could see if it has unusual properties due to the quasicrystalline structure it was forced to adopt."

Silver and aluminum were chosen because they have low surface energies. In other words, they easily spread out to "wet" the substrate to which they're applied. To deposit these materials, a molecular beam source was used to vaporize pure aluminum, and the gaseous atoms then landed on the clean surface of the substrate.

"These atoms, we believe, are quite mobile," Thiel says. "To our surprise, they seem to find very specific sites on the surface and form in unique arrangements that look like starfish."

The "starfish" are comprised of five, or possibly six, atoms of



*This micrograph of the quasicrystalline substrate shows the "starfish" located at the various trap sites, 2 Å-deep holes.*

aluminum that gather in a star shape around 2 Å-deep holes in the surface of the materials. At this point, it's not clear if a sixth atom locates in the center hole.

"This is remarkable for a couple of reasons," Thiel adds. "In a normal crystalline material, you have homogeneous nucleation where the deposited atoms diffuse and collide, and randomly form new islands on the substrate. Here, we see site-specific nucleation – the atoms diffuse and cluster at the holes, which are trap sites. So the surface is dictating the nucleation, and the arrangement of these nanostructure islands is not at all random."

"The other interesting thing is that the atoms are arranged pseudomorphically," Thiel says. "The aluminum atoms arrange in a pentagonal symmetry that they would not want to adopt in the bulk. The starfish are also nearly

identical in size, which is another level of control not normally seen. Nature has manufactured something that's remarkably uniform."

This research, as well as the preparation of quasicrystalline materials, continues to keep Ames Laboratory among the world leaders in the field of quasicrystal research. So it's only fitting that Thiel and colleagues Cynthia Jenks and Dan Sordellet are co-organizers for the Ninth International Conference on Quasicrystals, to be held in Ames May 22-26, 2005 (<http://www.icq9.ameslab.gov/index.html>). ■

*~ Kerry Gibson*

# Holiday Auction Item Donations Needed

*Bring in an item, get free hot chocolate*



**Make your house "homey" for the holidays with the winning bid on this small candle screen that comes with two framed cross-stitch pieces: one is a welcome sign (below) and the other a red, white and blue patriotic design that reads, "America, land that I love" (upper right).**

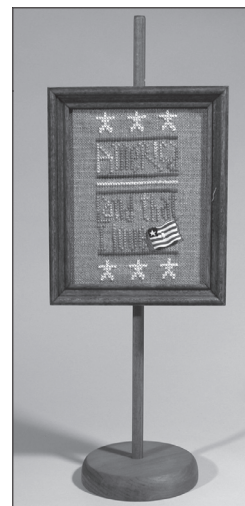


**T**he first benefit auction items for this year's Ames Lab/IPRT Holiday Celebration, Dec. 9, have rolled into the Public Affairs Office. A few of them are displayed in the surrounding photos and while it's a good start, we need to have many more items to keep the auction on par with the past two years. The sooner Public Affairs starts getting auction items, the sooner we can post them for you to view by going to <http://www.internal.ameslab.gov> and clicking on the link to the silent auction site. As with last year's silent auction, donated items will be placed on display in Public Affairs, 111 TASF, where employees can stop to place their bids.

This year, The Arc of Story County will be the recipient of funds raised at the Ames Lab/IPRT Holiday Auction. The Arc's mission is to enrich the lives of persons with developmental disabilities as they learn, work, play and grow within the community.

Early donations to the mitten, hat and scarf tree and the food pantry may also be brought to Public Affairs. These items will once again be donated to Mid-Iowa Community Action.

As an added incentive, when you bring in an item to Public Affairs, you'll receive a free cup of hot chocolate. Or bring in the coupon below and sip some hot chocolate while you check out the items that will be up for bid.



**This ceramic container holds a bright red candle that will add a warm glow to your holiday season. The lid to the container is decorated with festive holly sprigs.**



**You've heard of Christmas in July – well, what about the Fourth of July in December! With the winning bid, you can take home this red, white and blue crocheted rug and have it on hand for the fireworks season!**



**With the winning bid, you can take home this gleaming red, green and gold serving bowl to help brighten your table this holiday season.**